

WHAT IS CLAIMED IS:

1. A method for sterilizing a preparation containing at least one tissue comprising irradiating said preparation comprising at least one tissue with gamma radiation at ambient temperature or below at an effective dose rate for a period of time effective to sterilize said preparation containing at least one tissue, wherein said effective dose rate is not constant and comprises a rate between 0.1 kGy/hr to 3.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time.

2. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.25 kGy/hr to 2.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time.

3. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.5 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time.

4. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time.

5. The method according to claim 1, wherein said irradiating is carried out at a temperature below ambient temperature.

6. The method according to claim 1, wherein said irradiating is carried out at a temperature below the freezing point of at least one component of said preparation containing at least one tissue.

7. The method according to claim 1, wherein said preparation containing at least one tissue further comprises at least one stabilizer in an amount effective to protect said preparation containing at least one tissue.

8. The method according to claim 7, wherein said preparation containing at least one tissue comprises bone.

9. The method according to claim 7 or 8, wherein said at least one stabilizer is selected from the group consisting of mannitol, trehalose, polyhydric alcohols, DMSO and mixtures of two or more thereof.

10. The method according to claim 8, wherein said preparation containing at least one tissue is lyophilized.

11. The method according to claim 7, 8 or 10, wherein said at least one stabilizer consists essentially of mannitol, a polyhydric alcohol and DMSO.

12. The method according to claim 7, 8 or 10, wherein said at least one stabilizer consists essentially of mannitol, trehalose, a polyhydric alcohol and DMSO.

13. The method according to claim 1, wherein said preparation containing at least one tissue further comprises a mixture of at least two stabilizers which are together effective to protect said preparation containing at least one tissue.

14. The method according to claim 13, wherein said mixture of at least two stabilizers comprises at least two members selected from the group consisting of mannitol, trehalose, polyhydric alcohols and DMSO.

15. The method according to claim 1, wherein said preparation containing at least one tissue further comprises a mixture of at least three stabilizers which are together effective to protect said preparation containing at least one tissue.

16. The method according to claim 15, wherein said mixture of at least three stabilizers comprises at least three members selected from the group consisting of mannitol, trehalose, polyhydric alcohols and DMSO.

17. The method according to claim 1, wherein said preparation containing at least one tissue further comprises a mixture of at least four stabilizers which are together effective to protect said preparation containing at least one tissue.

18. The method according to claim 1, wherein said preparation containing at least one tissue further comprises mannitol.

19. The method according to claim 1, wherein said preparation containing at least one tissue further comprises trehalose.

20. The method according to claim 1, wherein said preparation containing at least one tissue further comprises at least one polyhydric alcohol.

21. The method according to claim 1, wherein said preparation containing at least one tissue further comprises DMSO.

22. The method according to claim 1 or 7, wherein said preparation containing at least one tissue comprises at least one member selected from the group consisting of ligaments, tendons, nerves, bone, teeth, skin, bone marrow, heart valves, cartilage, corneas, arteries, veins, organs, limbs, digits and mixtures of two or more thereof.

23. The method according to claim 1, wherein said preparation containing at least one tissue comprises bone.

24. The method according to claim 23, wherein said preparation containing at least one tissue is lyophilized.

25. The method according to claim 1 or 7, wherein said preparation containing at least one tissue comprises demineralized bone matrix.

26. The method according to claim 1 or 7, wherein said effective dose rate comprises a rate between 0.25 kGy/hr to 2.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and said irradiating is carried out at a temperature below ambient temperature.

27. The method according to claim 1 or 7, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.5 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and said irradiating is carried out at a temperature below ambient temperature.

28. The method according to claim 1 or 7, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.0 kGy/hr for at least a portion of said period of time and a rate

of at least 6.0 kGy/hr for at least another portion of said period of time and said irradiating is carried out at a temperature below ambient temperature.

29. The method according to claim 1 or 7, wherein said effective dose rate comprises a rate between 0.25 kGy/hr to 2.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and said irradiating is carried out at a temperature below the freezing point of at least one component of said preparation containing at least one tissue.

30. The method according to claim 1 or 7, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.5 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and said irradiating is carried out at a temperature below the freezing point of at least one component of said preparation containing at least one tissue.

31. The method according to claim 1 or 7, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and said irradiating is carried out at a temperature below the freezing point of at least one component of said preparation containing at least one tissue.

32. The method according to claim 1 or 7, wherein said effective dose rate comprises a rate between 0.25 kGy/hr to 2.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and said preparation containing at least one tissue comprises at least one member selected from the group consisting of ligaments, tendons, nerves, bone, teeth, skin, bone marrow, heart valves, cartilage, corneas, arteries, veins, organs, limbs, digits and mixtures of two or more thereof.

33. The method according to claim 1 or 7, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.5 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and said preparation containing at least one tissue comprises at least one member selected from the group consisting of ligaments, tendons, nerves, bone, teeth, skin, bone marrow, heart valves, cartilage, corneas, arteries, veins, organs, limbs, digits and mixtures of two or more thereof.

34. The method according to claim 1 or 7, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and said preparation containing at least one tissue comprises at least one member selected from the group consisting of ligaments, tendons, nerves, bone, teeth, skin, bone marrow, heart valves, cartilage, corneas, arteries, veins, organs, limbs, digits and mixtures of two or more thereof.

35. The method according to claim 1 or 7, wherein said effective dose rate comprises a rate between 0.25 kGy/hr to 2.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and said preparation containing at least one tissue comprises bone.

36. The method according to claim 35, wherein said preparation containing at least one tissue is lyophilized.

37. The method according to claim 1 or 7, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.5 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and said preparation containing at least one tissue comprises bone.

38. The method according to claim 37, wherein said preparation containing at least one tissue is lyophilized.

39. The method according to claim 1 or 7, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and said preparation containing at least one tissue comprises bone.



40. The method according to claim 39, wherein said preparation containing at least one tissue is lyophilized.

41. The method according to claim 1 or 7, wherein said effective dose rate comprises a rate between 0.25 kGy/hr to 2.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and said preparation containing at least one tissue comprises demineralized bone matrix.

42. The method according to claim 1 or 7, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.5 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and said preparation containing at least one tissue comprises demineralized bone matrix.

43. The method according to claim 1 or 7, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and said preparation containing at least one tissue comprises demineralized bone matrix.

44. The method according to claim 1 or 7, wherein said irradiating is carried out at a temperature below ambient temperature and further wherein said preparation containing at least

one tissue comprises at least one stabilizer selected from the group consisting of mannitol, trehalose, polyhydric alcohols, DMSO and mixtures of two or more thereof.

45. The method according to claim 1 or 7, wherein said effective dose rate comprises a rate between 0.25 kGy/hr to 2.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below ambient temperature and further wherein said preparation containing at least one tissue comprises at least one stabilizer selected from the group consisting of mannitol, trehalose, polyhydric alcohols, DMSO and mixtures of two or more thereof.

46. The method according to claim 1 or 7, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.5 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below ambient temperature and further wherein said preparation containing at least one tissue comprises at least one stabilizer selected from the group consisting of mannitol, trehalose, polyhydric alcohols, DMSO and mixtures of two or more thereof.

47. The method according to claim 1 or 7, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.0 kGy/hr for at least a portion of said period of time and a rate

of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below ambient temperature and further wherein said preparation containing at least one tissue comprises at least one stabilizer selected from the group consisting of mannitol, trehalose, polyhydric alcohols, DMSO and mixtures of two or more thereof.

48. The method according to claim 1 or 7, wherein said irradiating is carried out at a temperature below the freezing point of at least one component of said preparation containing at least one tissue and further wherein said preparation containing at least one tissue comprises at least one stabilizer selected from the group consisting of mannitol, trehalose, polyhydric alcohols, DMSO and mixtures of two or more thereof.

49. The method according to claim 1 or 7, wherein said effective dose rate comprises a rate between 0.25 kGy/hr to 2.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below the freezing point of at least one component of said preparation containing at least one tissue and further wherein said preparation containing at least one tissue comprises at least one stabilizer selected from the group consisting of mannitol, trehalose, polyhydric alcohols, DMSO and mixtures of two or more thereof.

50. The method according to claim 1 or 7, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.5 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below the freezing point of at least one component of said preparation containing at least one tissue and further wherein said preparation containing at least one tissue comprises at least one stabilizer selected from the group consisting of mannitol, trehalose, polyhydric alcohols, DMSO and mixtures of two or more thereof.

51. The method according to claim 1 or 7, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below the freezing point of at least one component of said preparation containing at least one tissue and further wherein said preparation containing at least one tissue comprises at least one stabilizer selected from the group consisting of mannitol, trehalose, polyhydric alcohols, DMSO and mixtures of two or more thereof.

52. The method according to claim 1, wherein said irradiating is carried out at a temperature below ambient temperature and further wherein said preparation containing at least one tissue comprises mannitol.

53. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.25 kGy/hr to 2.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below ambient temperature and further wherein said preparation containing at least one tissue comprises mannitol.

54. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.5 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below ambient temperature and further wherein said preparation containing at least one tissue comprises mannitol.

55. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below ambient temperature and further wherein said preparation containing at least one tissue comprises mannitol.

56. The method according to claim 1, wherein said irradiating is carried out at a temperature below the freezing point of at least one component of said preparation containing at

least one tissue and further wherein said preparation containing at least one tissue comprises mannitol.

57. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.25 kGy/hr to 2.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below the freezing point of at least one component of said preparation containing at least one tissue and further wherein said preparation containing at least one tissue comprises mannitol.

58. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.5 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below the freezing point of at least one component of said preparation containing at least one tissue and further wherein said preparation containing at least one tissue comprises mannitol.

59. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below the freezing point of at least one component of

said preparation containing at least one tissue and further wherein said preparation containing at least one tissue comprises mannitol.

60. The method according to claim 1, wherein said irradiating is carried out at a temperature below ambient temperature and further wherein said preparation containing at least one tissue comprises trehalose.

61. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.25 kGy/hr to 2.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below ambient temperature and further wherein said preparation containing at least one tissue comprises trehalose.

62. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.5 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below ambient temperature and further wherein said preparation containing at least one tissue comprises trehalose.

63. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.0 kGy/hr for at least a portion of said period of time and a rate

of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below ambient temperature and further wherein said preparation containing at least one tissue comprises trehalose.

64. The method according to claim 1, wherein said irradiating is carried out at a temperature below the freezing point of at least one component of said preparation containing at least one tissue and further wherein said preparation containing at least one tissue comprises trehalose.

65. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.25 kGy/hr to 2.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below the freezing point of at least one component of said preparation containing at least one tissue and further wherein said preparation containing at least one tissue comprises trehalose.

66. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.5 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below the freezing point of at least one component of



said preparation containing at least one tissue and further wherein said preparation containing at least one tissue comprises trehalose.

67. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below the freezing point of at least one component of said preparation containing at least one tissue and further wherein said preparation containing at least one tissue comprises trehalose.

68. The method according to claim 1, wherein said irradiating is carried out at a temperature below ambient temperature and further wherein said preparation containing at least one tissue comprises at least one polyhydric alcohol.

69. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.25 kGy/hr to 2.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below ambient temperature and further wherein said preparation containing at least one tissue comprises at least one polyhydric alcohol.

70. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.5 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below ambient temperature and further wherein said preparation containing at least one tissue comprises at least one polyhydric alcohol.

71. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below ambient temperature and further wherein said preparation containing at least one tissue comprises at least one polyhydric alcohol.

72. The method according to claim 1, wherein said irradiating is carried out at a temperature below the freezing point of at least one component of said preparation containing at least one tissue and further wherein said preparation containing at least one tissue comprises at least one polyhydric alcohol.

73. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.25 kGy/hr to 2.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below the freezing point of at least one component of

said preparation containing at least one tissue and further wherein said preparation containing at least one tissue comprises at least one polyhydric alcohol.

74. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.5 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below the freezing point of at least one component of said preparation containing at least one tissue and further wherein said preparation containing at least one tissue comprises at least one polyhydric alcohol.

75. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below the freezing point of at least one component of said preparation containing at least one tissue and further wherein said preparation containing at least one tissue comprises at least one polyhydric alcohol.

76. The method according to claim 1, wherein said irradiating is carried out at a temperature below ambient temperature and further wherein said preparation containing at least one tissue comprises DMSO.

77. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.25 kGy/hr to 2.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below ambient temperature and further wherein said preparation containing at least one tissue comprises DMSO.

78. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.5 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below ambient temperature and further wherein said preparation containing at least one tissue comprises DMSO.

79. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below ambient temperature and further wherein said preparation containing at least one tissue comprises DMSO.

80. The method according to claim 1, wherein said irradiating is carried out at a temperature below the freezing point of at least one component of said preparation containing at

least one tissue and further wherein said preparation containing at least one tissue comprises DMSO.

81. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.25 kGy/hr to 2.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below the freezing point of at least one component of said preparation containing at least one tissue and further wherein said preparation containing at least one tissue comprises DMSO.

82. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.5 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below the freezing point of at least one component of said preparation containing at least one tissue and further wherein said preparation containing at least one tissue comprises DMSO.

83. The method according to claim 1, wherein said effective dose rate comprises a rate between 0.5 kGy/hr to 1.0 kGy/hr for at least a portion of said period of time and a rate of at least 6.0 kGy/hr for at least another portion of said period of time and wherein said irradiating is carried out at a temperature below the freezing point of at least one component of

said preparation containing at least one tissue and further wherein said preparation containing at least one tissue comprises DMSO.

84. The method according to claim 1, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

85. The method according to claim 2, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

86. The method according to claim 3, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

87. The method according to claim 4, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

88. The method according to claim 5, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

89. The method according to claim 6, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

90. The method according to claim 7, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

91. The method according to claim 22, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

92. The method according to claim 23, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

93. The method according to claim 1, 7, 8 or 10, wherein said irradiating is carried out at a temperature between 0°C and -78°C.

94. The method according to claim 1, 7, 8 or 10, wherein said irradiating is carried out at a temperature between 0°C and -40°C.

95. The method according to claim 13 or 14, wherein said irradiating is carried out at a temperature between 0°C and -78°C.

96. The method according to claim 13 or 14, wherein said irradiating is carried out at a temperature between 0°C and -40°C.

97. The method according to claim 15 or 16, wherein said irradiating is carried out at a temperature between 0°C and -78°C.

98. The method according to claim 15 or 16, wherein said irradiating is carried out at a temperature between 0°C and -40°C.

99. The method according to claim 17, wherein said irradiating is carried out at a temperature between 0°C and -78°C.

100. The method according to claim 17, wherein said irradiating is carried out at a temperature between 0°C and -40°C.

101. The method according to claim 8 or 10, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

102. The method according to claim 13 or 14, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

103. The method according to claim 15 or 16, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.



104. The method according to claim 17, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

105. The method according to claim 18, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

106. The method according to claim 19, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

107. The method according to claim 20, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

108. The method according to claim 21, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

109. The method according to claim 22, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

110. The method according to claim 24, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

111. The method according to claim 26, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

112. The method according to claim 27, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

113. The method according to claim 28, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

114. The method according to claim 29, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

115. The method according to claim 30, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

116. The method according to claim 31, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

117. The method according to claim 32, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

118. The method according to claim 33, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

119. The method according to claim 34, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

120. The method according to claim 35, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

121. The method according to claim 36, wherein said effective dose rate further comprises a rate of at least 16.0 kGy/hr for at least another portion of said period of time.

122. The method according to claim 1 or 7, wherein said irradiating comprises at least one additional rate for at least another portion of said period of time.

123. The method according to claim 1 or 7, wherein said rates are applied in any order.

124. The method according to claim 1 or 7, wherein said effective dose rate is discontinuous.

125. The method according to claim 1 or 7, wherein said effective dose rate is variable.

126. The method according to claim 1 or 7, wherein said effective dose rate is continuous.

127. The method according to claim 1 or 7, wherein said irradiating is carried out at about the temperature of dry ice.

128. The method according to claim 1 or 7, wherein said preparation containing at least one tissue comprises at least one mammalian tissue.

129. The method according to claim 1 or 7, wherein said preparation containing at least one tissue comprises at least one bovine tissue.

130. The method according to claim 1 or 7, wherein said preparation containing at least one tissue comprises at least one porcine tissue.

131. The method according to claim 1 or 7, wherein said preparation containing at least one tissue is irradiated to a total dose of at least 10 kGy.

132. The method according to claim 1 or 7, wherein said preparation containing at least one tissue is irradiated to a total dose of at least 25 kGy.

133. The method according to claim 1 or 7, wherein said preparation containing at least one tissue is irradiated to a total dose of at least 30 kGy.

134. The method according to claim 1 or 7, wherein said preparation containing at least one tissue is irradiated to a total dose of at least 40 kGy.

135. The method according to claim 1 or 7, wherein said preparation containing at least one tissue is irradiated to a total dose of at least 45 kGy.

136. The method according to claim 1 or 7, wherein said preparation containing at least one tissue is irradiated to a total dose of at least 50 kGy.

137. The method according to claim 1 or 7, wherein said preparation containing at least one tissue is irradiated to a total dose of at least 75 kGy.